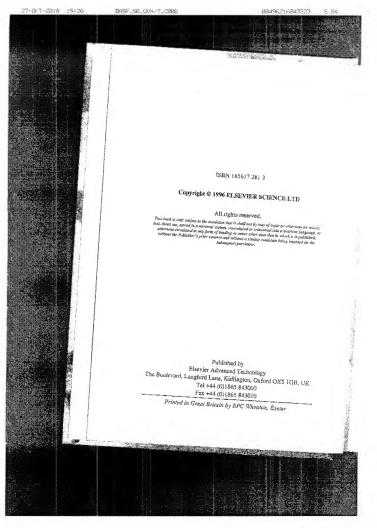
# A D D I T I V E S P L A S T I C S H a n d b o a k John Murphy





n Plastics Handbook

reality of stouric acid lispersion of mineral

s in PVC composites, tions without producypes;

for high temperature valopment);

splications.

emative to silmes and y are not colour body y do not interest with AALS) and, in unfilled . Neoakkaxy amonasts of polymers to metal iginal high cost.

Additives for Plastics Handbook

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#### Chapter 14: Plasticisers

į	Short-cut	onformation
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٤	( 440,000,000 )			
	Function	Added to make a compound more flexible, casier to process; mainly used with PVC; also for cellulosics		
1	Properties affected	Fiexibility, viscosity		
	Materials/ characteristics	Monomeric: esters of phinalmes, adiputes, mellitures Polymerisable esters: di-phthalate ester		
	Disadvantages	Migration; strict compliance with food contact regulations		
	New develop- ments	Greater efficiency at lower addition levels, easier mixing; replacement of potentially hazardous types; reduction of leaching/migration		

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s for Pinstex Handka.	bits simplifies supplies of
Additive	Maskingers.

fr supprise acid

reportes processions on to care our sauge of proposes, or reponding season, an Seatilie st lou-temperature (sub-zero and sold below). Planteliums are low moteration	oligonentio additives a tibela are compatible with rigid themospiassic patients, endorig these ventringial or leathers/enkhots in behaviour. They can be other ma-potpurin transferia or publicate impact modifiem. Scarce frams at combinantimens in the	produce a degree of informal plansiciting. Certain planticisers care also perform ob- formations, assisting in information consisting and patterns on the functions and address such as liber and patterns and governal intrication of the commonant (including enough release).
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The largest usee by far of plasticiscus (abount 80%) is PVC, which is unprocessed.

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OCCUPATION OF THE PROPERTY OF	
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300 10 636	1322
C CHR SC R	Masticisage
KENCHEEF, MO	groups of
encer a pa	The main
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Phillum acid esters:		to the state of migration
Diethyl becyl philosins (minity called diocys philo- late - DOP)	Most widely used: good golling, relatively nan- voluilly suder heat, sutsfarcing electron preparties and highly alastic compounds with reasonable cold strongs.	or other live
Disoudecyl phibalite (DFDP)	Leng-term beat-resistance up to 1925°C	of the second fatty as
Phthalates of straight-chain CML, alcohols	Chocal term, volatile behaviour and good low- temperature properties	A PANCE pates and also in the final form. Advi
Estats of adipic and sebacic acid.	36:	
Disadonyi odquae (DIDA)	Less valable than diveryl estar (DOA, DOS)	
Citato acid estars	Physiologically harmless: used in food industry	Security ac
Polyglyool fatty and esters	Good low-temporature resistance (to '30'C) and time-tem beat resistance (180'C); addition of 0.05%, birthered A pervents splitting of out-alrethed-ester planticiers under feet, stress splitting of sub-alrethed-ester	and a
Dictacky plouphata (ICP).	Chestanding hear resistance, good edoctrical proper- lies, weather resistance, flanceproof, now welstund to low brapersistance; should not be seed for produce, in contain with the skin, Other physipates have lower revisions, or how.	L. rib

difficult to incorporateirompatible with PVC only in extrusipat/calendering campounds (polynamic); manalighatic hydrocarbons, nineral tilk or fats, some engratory, scarcely volmile, how dependency on Midway between DOP and TCP in playsbosing nemperatura: semen typos cesási estancison iry properties: widely rest in Corneas Sumble for pastex (obgornants) md \$33,855 \$13,825 \$13,83

Combase functions of plasticiscus and subclising Soft films without planteiser

Contidend saya bean oil. MEVA graft polymer

Kidised extern

(soga bean oil, linseed oil) are used as statishing pinsticisers with B. Manufacturers. Weresture and Invernational Persieus Heustrook.

nest dispersing agents in plassicised PVC. Alkyl epitiky stearabs m ecsistance, in PVC compounds, alkyd resins and chlorinated s low viscossity stabiliseus, experially in PVC passes, with some low temperature properties. They are in liquid form. Soya bean and approval for fond contact. Advice should be sought for other

vice should be stught on food comact appayed. Steams acid owters s and processing agains for various playies and also as labrames is and monocarbox elic, acids can be used as viscosity depressants to as secondary plasticisms for plasticism PVC compounds. They we some solid and have general food contact approval

parties are good low temperature phasicisem for PVC, in inquid at feed compart approval.

s of high molecular weight about are used as special plasticisors. sonif-solid form, Dissonidery) phthains (liquid) is used for beatemotiny) cyclobracy) plobalete (byold) is a special plasticism for mer (Aliquida) its achiegally head newstram physicisms, pay unabilitized for

COSESSE

institutes are derived from escrification of pittains antiyonda, as transliter cheers in PVC after good low temperature performance. Motorslicives for Plantes Handbook

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offers low fusion temperature circa 160 and 261 are well-

used in viryl plantsols where it for high solvency and good alone and much higher than ty reains and polyester.

ex SR-660 planticisors, enhancne temperature cure properties

endocrine modulating effects of e phinialise esters may produce ine rodents. Effects reported in alate (BBP) may be attributable iffect observed is very week at tion, such effects have not been spirity tests at very high de-

a European Chemical Industry and Intermediates (ECFI) an agency with the scientific concurrent to the scientific continguishing of whether asdates. They are also complicaually to be able to carry out a se-cooperation with the Europe (ECFTOC).

iscrine modulating affects. Pebrua

#### Chapter 15: Process modifiers and processing aids

Short-cut infi	rmation:	
Process modifiers and processing aids		
Panction	Improvement of processability of compounds: lubrication, higher output/lower energy Modification of polymer properties: sucleation for greater product homogeneity, clarifying agents for improved improved improved.	
Properties affected	Productivity Product quality, transparency	
Materials/ characteristics	Fluoropolymers Sorbitol clarifying agents Edustomeric property modifiers, polybunene, acrylic Silicone modifiers MBS. acrylic impact modifiers Feny acid dispersion sids	
Disadvantages	No significant disadvantages known	
<b>`</b>	Improvement in productivity, energy requirement for processing	

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# Additives for Plasters Handlank

#### Resin madifiers

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#### Chermopdastics

Polybuses in a modifier in polypropyleneselysboar-propylane clastrater thesis gives leaditic compounds with good impact stangth and processability. A recent study for impact m -20°C, while fiexural exception values are 27,000-38,000 psi and each flow. Amoun) showed that at a layer of about 50% of the chastomer eventent there is no break is 80-100% higher from the unexcitived blends (contributing to better processability). Although polyburens reduces the tensile suragh, heat distortion temperature and hadness of the triends, conqueends have a poort balance of properties.

covers and much guards, gasketing and wire jacketing and replacement of plasticied rem Exxon) are used as impain enodifiers, compatibiliseus and adhesion promotes, Poemial applications include the Managementive components such as air bag deer Extrusion grafted (nestweets), aminated) enlyotefan-based polymens (such as fixator, \*VC. in toys, aporting goods, took and other consistent items.

giving a valuable combination of properties for high-value applications:

- Impact modification of engineering thermophastics
- Compatibilisation of polymer blends, in alleying and recycling
- Adhesion onlawscement of polyodelins to mentl, glass and point substrates, by ceextrusion, CTR and extrusion coating
- Polymer matrix affection to confercing agrees, such as glass fibre and inorganic (thets, and to flame retordings, such as magnesian hydroxide ٠
- ineta, and in indopressons, social as regimental mysterine. Adresion of FPOM electorers to poler substance. En resbank tuncs and V-bets, and of general purpose rubbers to carcass in tyre aclewail compounds is also raproved, as is oc-subcausation of EPDM with potar rutibers

They offer law levels of resultal organized monoman, minimising industrial hygicus problems and offer good colour with low level of contaminants and easy banding is compounding operatems.

## Elastonser modelfaution

Previously payfic classicists were isod only in the rubber industry and convenience. Gregnene AR, however, a tested on a soft plane only, which increases the specific While is claimed to be an enginesi extreoringy for readdification of exten 6 with conveniental market adding in granule form his ness developed by End Ness Euchgran polymers (ASSA or core-shell acrybase polymers) are based on the robbox so bore plasses)

subber efficiency in the impact assessment characteristics, so different from other indianumi elestoreers (IIPR, SEBS) used in reselfication of refus

Applicace for Plastics Handrook

Manage with 20-25% of other classeners. Both the low lovel of public, and indirect Extensive inhotentary tests have, shows that supportugitness lovel is obtained with Mile 17% Europamo AR and lespact consideral characteristics me boths than those characteristics of the soft-phase arrylic increase the resistance to tagis temperature (Vical B = 170°C und the Berneal excludes of avoidified sylon. The high themplimeclemical fection and the potentity of these rubbers also allows post-frustments to the aylon which

#### New technology to harness effermen were not previously possible.

tate them into organic polygraza systems. In particular, distribution and domain size of the New technology simple at attlising the properties of adjounce areas officiality in of preparies which makes them interesting as randifiers (or pinstics, immoving impact additives has been auguneered by Wacker Chemic Cookid. Silknows offer a combination mistance and giving constance to change in temperature and weathering. But, because they are not compatible with enganic polymers, it has ethen proved difficult to incorpo-Stereme phase has been difficult to control. Warter has developed what a describes as 'cuse-shell particles'; flexible silvour toris surrounded by an organopolymen shelf, with precisely defined particle sixes and pailible with other expanic palymer systems, allowing selective adjustment of the salicone way narrow particle-size distribution. The organe shall ruskes the particles highly commedified phase in the host polymer compound Properties which can be conferred by these additives include how temperature therepility, resistance to charging temperatures and UV resistance. Undestrable offerts, such By reciouse and depression of surface tension, which in the pass have from cansal by Memior of the silicene, have sex been observed.

## apact modifiers - PVC

Impact modifiers for PVC include matry! bundlone styrene (MRS) mai maylan.

MBS modifions improve impact strength of PVC compounds without sacrificing the the characteristics. They are used for a variety of rigid and sense digid applications and beases, such as blow resulting of itsales, calendoning of filts and sheet, extrusion of office and injection modifing of technical parts. Some types can also be unloved to said medic requirements. Norythe maddiffers significantly improve organi characteristics of PVC webout noy Mich of weathersteldy. The main applications are profiles, pipes and steers. Acrytic Personners are used in the reactor (traditionally the Grensen approach), but acrylic Milives are garaing to propulately as an efficient alternative